Competitive Advantage

in Advanced Manufacturing

Comparing British Columbia, Washington, Oregon and California

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INTRODUCTION

This brief compares costs and tax burdens for advanced secondary manufacturing in British Columbia, Washington State, Oregon and California. Appendix 1 lists the sources of information.

Particular attention is given to electronics manufacturing, which is the growth engine of California's Silicon Valley, and a key industry in the emerging high-technology corridor extending from Portland (Oregon) to Vancouver (British Columbia).

The information presented shows that British Columbia is cost competitive with its U.S. neighbors in advanced manufacturing, and that its tax environment is more favorable, which means higher potential profits.

The corporate tax burden calculations supporting this conclusion were verified by Price Waterhouse for an illustrative business case. Appendix 2 provides details.

This should be of interest both to offshore firms looking to establish greenfield plants or joint ventures on the West Coast of North America, and to British Columbia enterprises eyeing the competition south of the border.

If your company is seeking a North American production base which offers strategic and competitive advantages, British Columbia is an excellent choice.

For more information about the investment climate and investment opportunities in British Columbia contact:

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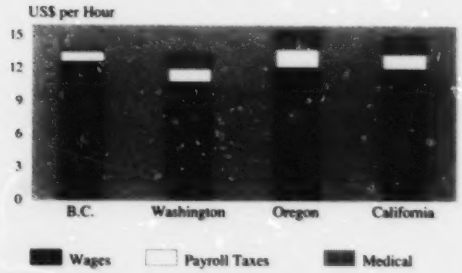
LABOR COSTS

Labor typically represents between one-quarter and one-half of total variable costs in advanced manufacturing, depending on the firm's size and particular line of production.

Labor costs include all components of labor compensation: direct pay, payroll taxes, and discretionary employee benefits, not just wages and salaries.

Hourly Compensation

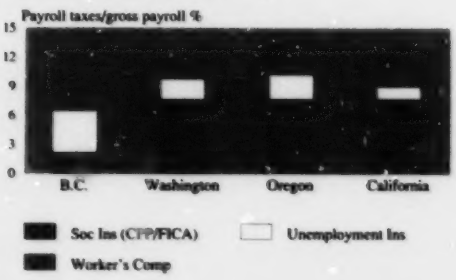
Labor Costs for Hourly Workers
Electronics Manufacturing



The average hourly compensation cost for production workers in electronics manufacturing in British Columbia and Washington is on par. The average cost is 11 per cent higher in Oregon and eight per cent higher in California.

Payroll Tax Burdens

Composition of Payroll Tax Burden*
Electronics Manufacturing



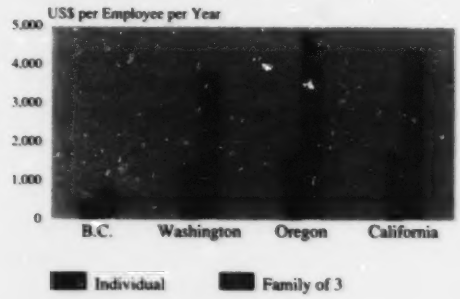
* Based on hourly-paid employees' wage

In British Columbia, payroll taxes paid by the employer amount to 6.8 per cent of the average hourly worker's gross pay in electronics manufacturing. The burden of mandatory payroll tax liabilities in the U.S. locations is 60 to 100 per cent greater.

Discretionary Employee Benefits

Company-paid health insurance is a common discretionary benefit in both Canada and the United States.

Medical Insurance Costs



Medical insurance costs in the West Coast states are four to six times higher than in British Columbia. This potentially represents a significant additional cost of doing business in the U.S.

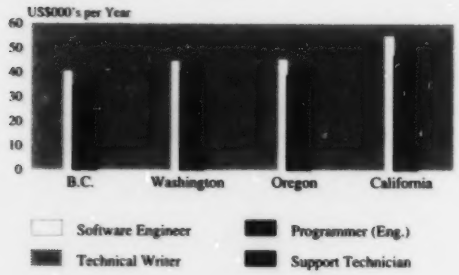
According to the U.S. Chamber of Commerce, the average cost per employee of health benefits in the United States increased by $315 or 12 per cent in 1990, and is escalating at more than double the rate of pay increases.

Professional and Technical Employees' Compensation

Adding value in advanced manufacturing depends heavily on the contribution of highly-qualified knowledge workers.

In British Columbia, total compensation costs are often 10 to 15 per cent below Washington and Oregon levels, and 15 to 30 per cent below Silicon Valley norms.

Labor Costs for Professional and Technical Workers

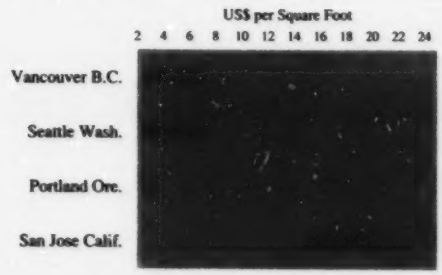


Construction Costs
Good quality industrial building

Industrial land costs in the outer suburbs of Vancouver and Seattle are virtually identical. Land is generally cheaper in Portland, but well-located sites are available on Vancouver's metropolitan fringe at comparable prices.

The mid-range of land prices in Silicon Valley are more than triple those in Vancouver.

Industrial Land Costs
Range in outer suburbs



LAND AND BUILDING COSTS*

The metropolitan areas of North America's West Coast are prime locations for advanced manufacturing industry.

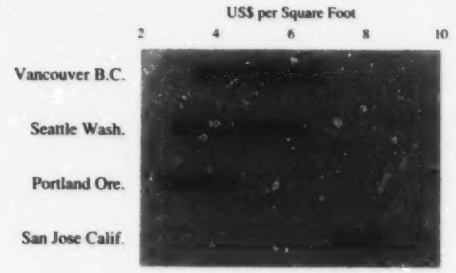
The cost of constructing manufacturing facilities varies little between Vancouver, Seattle and Portland. Construction costs in Silicon Valley (San Jose) are significantly higher.

*Building costs are normally the major component of total development costs for industrial facilities. Land usually represents a much smaller fraction and is rarely a decisive locational factor for advanced manufacturing firms.

Leasing is an option for firms that do not need purpose-built facilities.

Industrial rents in the Vancouver and Seattle areas are in the same range. Portland is less expensive on average, but rates in Vancouver's outer suburbs are competitive. Silicon Valley stands out again as the most expensive location.

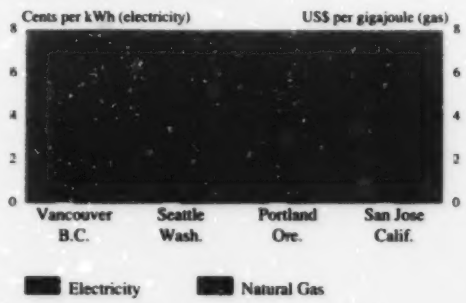
Industrial Lease Rates
Range in suburban areas



ENERGY COSTS

Industry in British Columbia benefits from some of the least expensive energy in North America. Abundant hydroelectricity and natural gas resources guarantee long term security of supply.

Industrial Energy Costs



An average industrial consumer in Vancouver pays about 20 per cent less for electricity than in Portland. Electricity costs in Vancouver and Seattle are about the same, but natural gas is one third less expensive in Vancouver.

Natural gas costs are one third higher in San Jose, compared with Vancouver. Electricity costs are almost double.

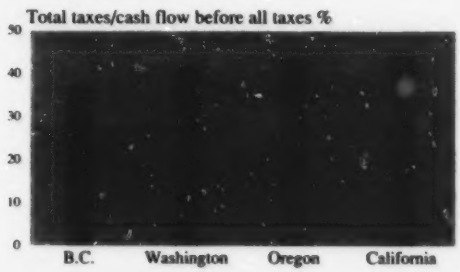
CORPORATE TAXATION

Comparing tax burdens in different jurisdictions using nominal tax rates or aggregate tax burden indicators is misleading.

Meaningful comparisons are possible only by examining the actual tax treatment of businesses under particular tax systems.

Tax Burdens

Corporate Tax Burdens *
Electronics Manufacturing Firm



* March 31, 1992 tax rates

The above chart summarizes the results of tax calculations for an electronics manufacturer operating in British Columbia, and the three West Coast states. These results were verified by Price Waterhouse.

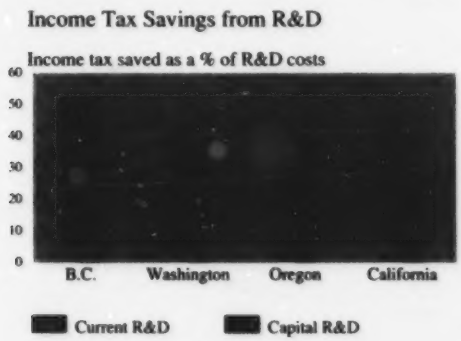
All significant taxes are included. To isolate the impact of taxes, revenues and costs other than taxes are assumed constant in each of the three locations; only the applicable tax liabilities of the firm vary. Appendix 2 provides further details.

The British Columbia firm has a lower total tax burden (37 per cent) than its counterparts in Washington (41 per cent), Oregon (43 per cent) and California (44 per cent).*

In this example, taxes not related to profitability (payroll taxes, property tax, sales tax, etc.), which are essentially fixed costs, represent 46 per cent of total tax liabilities in Washington, 41 per cent in Oregon, and 40 per cent in California. The proportion in British Columbia is only 32 per cent.

Tax Savings from R and D

An additional advantage for advanced manufacturing firms based in British Columbia is a more generous tax treatment of R and D expenditures, compared with U.S. locations. Larger income tax savings translate directly into larger cost savings.



*The tax burden measure used here should not be confused with the corporate income tax rate. It is the total amount of all taxes paid as a proportion of revenue less all non-tax expenses except depreciation, which is a non-cash expense. This provides a comprehensive and comparable measure of the total tax burden.

CONCLUSION

British Columbia is cost competitive with the West Coast states as a location for advanced manufacturing:

- total compensation costs for highly-qualified workers are lower;
- the after-tax cost of R and D is lower;
- total compensation costs for production labor are on par with Washington, and lower than in Oregon and California;
- the cost of developing manufacturing facilities in a metropolitan location is comparable with Washington and Oregon, but significantly lower than in California;
- energy costs are lower and long term security of energy supply is assured;
- the effective corporate tax burden is lower.

This adds up to a potentially more profitable environment for advanced manufacturing in British Columbia.

APPENDIX 1

The sources of statistical information used to produce the charts in this brief are summarized below.

1) **Labor Costs for Hourly Paid Workers Electronic Products Manufacturing**

Direct Pay: Statistics Canada; U.S. Department of Labor, Bureau of Labor Statistics. Figures are 1991 averages.

Payroll Taxes:

Workers' Compensation: Workers' Compensation Board of B.C.; Washington State Department of Labor and Industries; SAIF Corporation (private insurer in Oregon and California).

Unemployment Insurance: Employment and Immigration Canada, Benefits Program Division; Washington State Employment Security; Oregon Department of Human Resources, Employment Division; California Employment Development Department.

Social Insurance: Revenue Canada; U.S. Department of Social Security (social insurance refers to the federal Canada Pension Plan and the U.S. Federal Insurance Contribution Act).

Information compiled March 1992.

2) **Composition of Payroll Tax Burden Electronic Products Manufacturing**

See 1) above. Local payroll taxes applicable in some Oregon locations are not included in this calculation.

3) **Medical Insurance Costs**

Medical Services Plan of B.C.; King County Medical/Blue Shield; Blue Cross/Blue Shield of Oregon; Blue Cross/Blue Shield of California.

Information compiled August 1991.

4) **Labor Costs for Professional and Technical Workers**

Salaries: Source EDP, *1991 Local Metropolitan Computer Salary Survey*.

Payroll Taxes: see 1) above

5) **Industrial Land Costs**

Royal LePage, *Market Survey* (1991).

Society of Industrial and Office Realtors, *1991 Guide to Industrial and Office Real Estate Markets*.

6) **Construction Costs**

Marshall and Swift, *Valuation Quarterly* (January 1992)

Figures are for a good quality manufacturing building. Cost includes: site preparation; on-site services; fees, overhead and profit; labor; and materials.

Note that the Vancouver cost figure includes the goods and services tax which would be refunded via input tax credits.

7) **Industrial Lease Rates**

See 5) above

8) **Industrial Energy Costs**

Electricity: B.C. Hydro and Power Authority (January 1992); Portland General Electric (March 1992); Pacific Gas and Electric (April 1992).

Consumption: 400,000kWh per month (peak demand 1,000kW)

Natural gas: information supplied by gas utilities (March 1992).

Consumption: 7,500 gigajoules per month.

9) **Corporate Tax Burdens Electronics Manufacturing Firm**

Ministry of Economic Development, Small Business and Trade, Business Development and Investment Branch (refer to Appendix 2 for calculations).

10) **Income Tax Saving from R and D**

See 9) above

APPENDIX 2

Corporate Taxation

1) The tax burden calculations were produced using the Ministry of Economic Development, Small Business and Trade provincial and state financial simulation models. The calculations for this illustrative case were verified by tax accountants of Price Waterhouse.

The key assumptions used in the simulations are summarized below. The forecast period is 10 years. U.S. dollars are used throughout.*

Capital Investment and Financing Assumptions

Capital Costs	($000)
Land	500
Buildings[a]	1,500
Machinery & Equipment[b]	3,500
Total	5,500

a Depreciated over 31.5 years straight line in U.S. and at four per cent declining balance in Canada (half-year rule applied)

b Depreciated as 5-year class property under the Modified Accelerated Cost Recovery System in U.S. and at 30 per cent declining balance in Canada (half-year rule applied)

Financing	($000)
Equity	5,500
Total	5,500

*An exchange rate of C$1.00 = U.S. $0.85 was used for currency conversion. This is considered to be a representative exchange rate based on recent historical trends.

Operating Assumptions

	Year (1)	(2)	(3-10)
($000)			
Sales	5,000	10,000	15,000
Materials	2,000	3,800	5,700
Mfg labor (Av. pay $25,500)	900	1,700	2,550
Sales, admin and general labor (Av. pay $34,425)	486	918	1,377
R and D (Av. pay $42,000)	350	700	1,050
Mfg overhead	75	75	75
Electricity	100	100	100
General supplies	100	200	300

Note: The analysis is for an f.o.b. plant case (transportation costs are generally small relative to product value in advanced manufacturing).

2) The following taxes were computed from the accompanying table of nominal tax rates:

Federal income tax[a]
Provincial/state income tax
Capital tax (British Columbia only)
Gross receipts tax (Washington only)
Payroll taxes[b]
Provincial/state sales tax[c]
Property taxes[d]
Real property transfers tax (British Columbia only)[e]
Transit tax (Oregon only)

a Includes the manufacturing/processing deduction for British Columbia.

b Weighted average rates, based on average annual earnings for each job category, are: British Columbia (6.29%); Washington (9.8%); Oregon (12.67%); California (10.62%). Applied to all direct payroll costs and 80 per cent of R and D.

c Applied to five per cent of materials, 100 per cent of general supplies and overhead, and 20 per cent of R and D costs. Sales tax is applied also to 100 per cent of electricity in British Columbia. Local sales tax is applied to electricity in California.

Sales tax effectively applies only to materials component of buildings in British Columbia and California (50 per cent of total), but 100 per cent in Washington. 100 per cent of machinery and equipment cost is subject to sales tax.

d Applied to fixed assets depreciated straight line as follows: land (0%), buildings (4%, except California 0%). Machinery and equipment is depreciated according to specific schedules established for property tax purposes in the U.S. locations.
Note that property taxes are not levied on machinery and equipment in British Columbia.

e Applied to 100 per cent of land purchase price.

Note on the Canadian Goods and Services Tax.
Although this federal value-added tax applies to all of the firm's non-labor inputs, the tax burden is eliminated via input tax credits. Effectively only final consumption is taxed.

Tax Savings from R and D

The following is a simplified description of the calculation to determine income tax savings via R and D spending.

1) The example assumes a five year R and D program with constant current expenditure in each year and a one-time capital expenditure in the first year (the dollar amounts are only significant to the extent that there is sufficient taxable income in every year to fully utilize credits and deductions).

2) In British Columbia, 100 per cent of current expenditures and the entire capital expenditure are written-off against tax in the year they are incurred.

3) The annual current expenditures earn a 20 per cent tax credit each year for the British Columbia firm while the capital expenditure earns a onetime 20 per cent credit (tax credits must be added back to the following year's income). This rate is for a non-Canadian-controlled private corporation.

4) The U.S. firms are assumed to spend a sufficient amount on current R and D to earn annual tax credits equal to 10 per cent of this expenditure, which is the maximum credit available under the U.S. tax system. The credits earned in the current year must be deducted from R and D expenditures written off against income tax in that year.

5) The capital expenditure by the U.S. firms is depreciated over six years under the Modified Accelerated Cost Recovery System to obtain the maximum allowed tax savings (the extra year is required to fully depreciate the asset, due to the half-year rule).

Disclaimer

While every effort has been made to ensure the accuracy of the information contained in this document, this is not guaranteed. Accordingly, the Ministry of Economic Development, Small Business and Trade, the Province of British Columbia, and Price Waterhouse accept no liability for actions taken based on this material.

COMPARATIVE NOMINAL PERCENTAGE TAX RATES (effective March 31, 1992)

	BRITISH COLUMBIA	WASHINGTON	OREGON	CALIFORNIA
Corporate Income Taxes				
% of taxable income				
Federal	23.84[a]/28.84	34.0	34.0	34.0
Provincial/State	16.0[b]	Nil	6.6	9.3
Corporation Capital Tax	0.3	N/A	N/A	N/A
Gross Receipts Tax				
% of sales revenue	N/A	0.484	N/A	N/A
Sales Taxes				
% of purchase price				
Provincial/State/Local				
General	6.0	7.8*	Nil	8.25
Electricity	6.0	Nil	Nil	5.15
Real Property Transfers Tax				
% of purchase price	1.0 on first C$200,000 2.0 on balance	Nil	Nil	Nil
Transit Tax				
% of gross payroll	Nil	Nil	0.6179*	Nil
Social Insurance				
% of gross payroll	2.4	7.65	7.65	7.65
Base maximum	C $32,200[b]	US $55,500	US $55,500	US $55,500
Unemployment Insurance				
% of gross pay				
Federal	4.2	6.2	6.2	6.2
Base maximum	C $36,920	US $7,000	US $7,000	US $7,000
Provincial/State	Nil	2.2	3.2	3.5[c]
Base maximum	N/A	US $17,600	US $17,000	US $7,000
Workers' Compensation[d]				
% of gross pay	0.5	US $0.1235 *per hour*	3.35	2.63
Base maximum	C $48,000	None	None	None
Property Tax*				
% of assessed value				
Land and Buildings	2.645	1.56	2.486	1.076
Machinery and Equipment	Nil	1.56	2.486	1.076

a Rates are for a non-Canadian-controlled private corporation. Lower federal rate is for manufacturing (1993 and 1994 rates are 22.84 per cent and 21.84 per cent).

b First C$3,200 exempt.

c Includes 0.1 per cent training charge.

d Rates are for electronic products manufacturing. Lower rates apply to non-production workers in the U.S. locations.

* Includes local taxes for Vancouver (Delta); Seattle-Tacoma (Puyallup); Portland (Hillsboro); San Jose.

Note: All payroll tax rates are for employers' contributions.